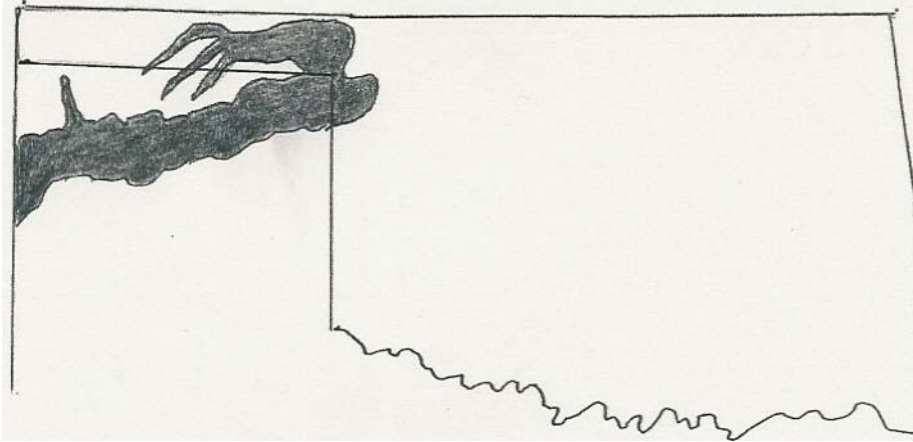


**UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE**

ECOLOGICAL SITE DESCRIPTION



Texas and Oklahoma Panhandle (MLRA 77E)

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site ID: R077EY061TX

Site Name: Mixedland Slopes (formerly 077EY049OK, Limy Sandy Plains)

Precipitation Or Climatic Zone: PE 25-36 (Southern High Plains)

Original Site Description Approval:

Site Date: 3/27/95

Site Author: James R. Bell

Site Approval: Dan Caudle

Approval Date: 3/27/95

Revisions:

Revision Date: 12/12/02

Reviser: J. R. Bell

Revision Approval: Mark Moseley, Homer Sanchez

Revision Notes: Updated site with more current technical information and included vegetative states. This site has been correlated for Texas and Oklahoma.

PHYSIOGRAPHIC FEATURES:

Narrative: This site is an upland with deep, coarse loamy calcareous soils and moderate to moderately steep sloping topography. It occurs as moderately long to long slopes averaging 5 to 8 percent and is a transitional site between the level portion of the high plains and the rolling terrain below.

Landform: Footslopes of Upland Hills

Deep, moderately coarse loamy soils with uniform moderate to moderately steep sloping topography. Cross slopes are gentle and the site may appear as a low ridges, slightly concave or convex areas, or as alluvial fans and benches incised by U-shaped gullies. The site is formed in exposed Ogallala sediments and slopes are generally in the direction of the major draws or streams. The position on the landscape is that of erosional slopes below high plains escarpments and above major drainages.

	Minimum	Maximum
Elevation: (feet)	2600	3800
Slope (percent)	3	12
Water Table Depth (inches)	N/A	
Flooding:		
Frequency:	N/A	
Duration:	N/A	
Ponding:	N/A	
Runoff Class:	moderate to moderately rapid	

CLIMATIC FEATURES:

Narrative: The climate is semiarid continental. Summers are hot with winters generally being mild. Temperature extremes are common. Humidity is generally low, and short-term droughts are common. Wind speeds average 12 mph, and are highest in early spring. The prevailing wind direction is southwest. In the fall and winter, northers are common with severe temperature drops. Cold spells do not generally last more than a few days.

Most of the precipitation occurs from May to September. Rainfall events often occur as intense thunderstorms of relatively short duration. Snowfall average is about 13 inches. Long term droughts occur every 15 to 20 years and may last 4 to 5 years.

Growing season averages 195 days. Average first frost is around October 22, and the last freeze of the season occurs around April 1.

	Minimum	Maximum
Frost-free period (days):	195	210
Freeze-free period (days):	190	200
Mean annual precipitation (inches):	16	21
Mean annual air temperature (°F):	54	62
Mean annual soil temperature (°F):	58	61

Monthly moisture and temperature distribution:

	Mean precipitation (in)	Percent precipitation (%)	Avg. Daily Maximum Temperature (°F)	Avg. Daily Minimum Temperature (°F)	Mean temperature (°F)
January	0.50	2.6	49.3	22.0	35.6
February	0.63	3.2	54.7	26.9	40.8
March	1.10	5.7	63.2	33.3	48.2
April	1.40	7.3	73.8	43.9	58.8
May	3.10	16.1	81.4	53.1	67.2
June	3.15	16.4	88.9	62.1	75.5
July	3.20	16.7	91.7	66.5	79.1
August	2.10	11.0	89.4	64.7	77.0
September	1.45	7.5	82.6	57.6	70.1
October	1.26	6.5	74.0	46.0	60.0
November	0.71	3.7	61.5	34.3	47.9
December	0.54	2.8	52.8	25.4	39.0
Mean annual	19.14	100.0	71.9	42.90	58.2

Climate Stations	Station ID	Location	From	To
	TX 8523	Spearman, TX	1920	1999
	OK 3628	Hooker, OK	1948	1999
	TX 3787	Gruver, TX	1941	1995

INFLUENCING WATER FEATURES:

Narrative: Although infiltration on this site is moderate, the moderate to moderately steep slopes generate a significant amount of runoff. If good ground cover is present the runoff causes minimal erosion, but if ground cover is poor, gullies will develop. There are no surface water features present on this upland site other than some intermittent drainages that carry away runoff water during major rainfall events.

Wetland description: N/A

REPRESENTATIVE SOIL FEATURES:

Narrative: Moderate to moderately steep slopes with deep, calcareous fine sandy loam soils. They infiltrate water relatively well, but have only moderate water storage capacity. Maximum amounts of water are available for plant use. Plant roots easily penetrate the subsoil. Fertility is moderate to moderately low. There is no evident accumulation of clay in the subsoil. The soils are highly susceptible to both wind and water erosion when devoid of cover.

Parent Material Kind: Unconsolidated loam, and sands of the mid to upper Ogallala.

Parent Material Origin: Outwash apron from the Rocky Mountain uplift.

Surface Texture modifier: none

Subsurface Texture Group: fine sandy loams

Surface Fragments less than 3 inches (% cover): - < 2 %

Surface Fragments greater than 3 inches (% cover): - 0 %

Subsurface fragments less than 3 inches (% volume): - < 2 %

Subsurface fragments greater than 3 inches (% volume): - 0

	Minimum	Maximum
Drainage class:	well drained	somewhat excessively drained
Permeability Class:	moderately rapid	rapid
Depth: (inches)	30	48
Elec. Conductivity:	0 - 1	0 - 1
Sodium Absorption rate:		
Soil Reaction: (1:1 water)	pH 7.7	pH 8.3
Soil Reaction: (0.1M CaCl ₂)		
Available Water Capacity (in.)	2.6	4.2
Calcium Carbonate Equiv. (%)	2.5	5.0

Representative Soils: Mobeetie fine sandy loam

PLANT COMMUNITIES:

Ecological Dynamics of the Site:

The assumed historic climax plant community for this site is a mixture of tall grasses, mid-grasses, perennial forbs and a small amount of woody shrubs. It is a very diverse site and is capable of relatively high production when well managed. Plant available water is high due to moderately coarse soils and the lime content seems to favor plants like little bluestem and sideoats grama. The other major grass species include sand bluestem, Indiangrass, switchgrass, and assorted midgrass species. There are many perennial forb species present, including prairie clovers, Dalea, Engelmann's daisy, scurfpea, sensitive briar, gaura, bush morninglory, spiderwort, dayflower and many others. The main shrubs found on the site are sand sagebrush and skunkbush sumac. Infrequent sand plum thickets and scattered yucca also occur. Occasionally leadplant and inland ceanothus can be found on well-managed sites. Trees are scarce but occasional hackberry, cottonwood, and western soapberry may be observed. The production and variety make this site excellent habitat for quail, deer, prairie chicken, and pronghorn and a preferred grazing site for domestic livestock, especially cattle.

Natural fires played a major role in the development and maintenance of the tall grasses and generally helped keep woody shrubs suppressed. In the total absence of fire, shrubs tend to increase although slowly. With grazing abuse, exacerbated by weather extremes and absence of fire the shrub encroachment is more rapid. Generally this site in good ecological condition will produce enough fine fuel for fires to offer considerable suppression to woody vegetation.

All sites in this region developed under a fire/grazing interaction ecology. Large herbivores grazed the grasslands, especially following burns, and moved on seeking fresh forage. Recovery took place naturally because it is anticipated that sufficient

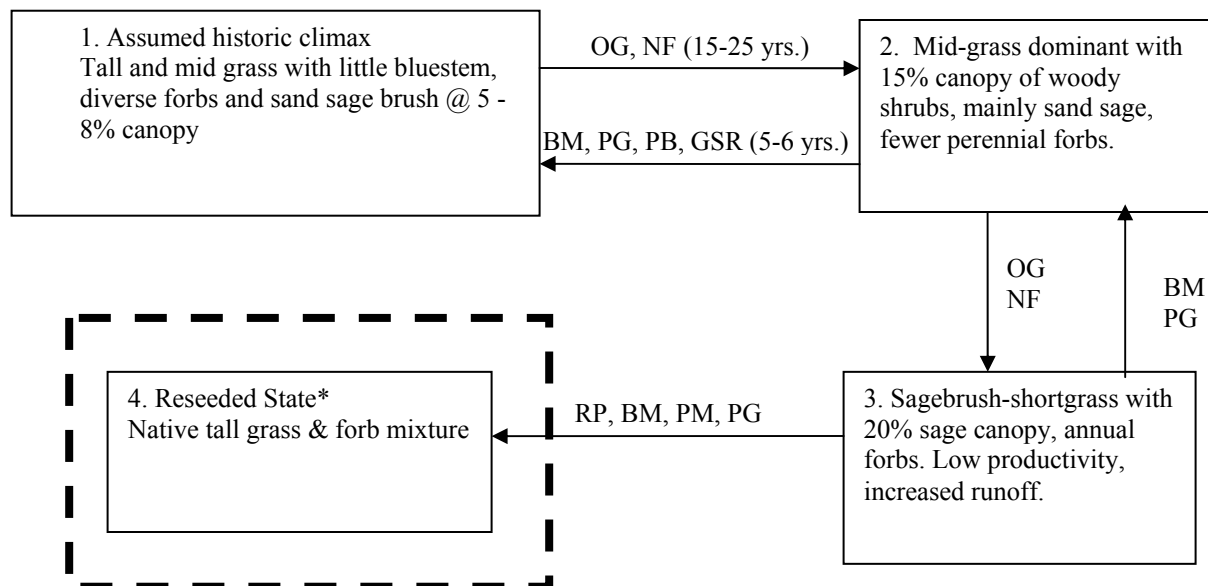
recovery time usually took place before the animals returned to graze the same area again. Prescribed grazing techniques can somewhat simulate this natural process.

This is a preferred site for domestic livestock and overgrazing can easily occur. If the tall grasses and palatable forbs are pressured for several years, plant succession will tend more toward midgrasses and shrubs. In instances of prolonged, severe grazing abuse, the site will revert to moderate canopies of sand sagebrush and short grass species. This site is diverse and productive, but perhaps not as resistant to ecological shifts in vegetation as the short grass sites that are associated with it. If the tall grasses decline, midgrasses increase and shrub encroachment begins, the balance can be influenced toward perceived historic climax by planned rest periods and the use of prescribed fire. In the absence of prescribed fire, the application of judicious chemical brush management can often produce similar results. The time period necessary to effect these kinds of vegetative changes is usually 3 to 4 years. Once midgrasses and a significant canopy of sagebrush dominate the site, a return to tall grass dominance will seldom happen without brush management and growing season rest. This process may take as much as 5 to 6 years with careful grazing management. If the vegetative state reaches the sagebrush - shortgrass dominance, it is certainly indicative of severe grazing abuse for many years. The site may remain stable in the sagebrush-short grass state, but it is neither productive nor diverse. Restoring a tall and midgrass community may be difficult once the vegetation reaches the short-grass shrub state. Reseeding may be feasible in some cases, but success depends on environmental conditions at the time, and the subsequent control of competing vegetation.

In the more diverse vegetative states, a variety of wildlife utilizes this site. The diversity of plant species makes this good habitat for quail, deer, pronghorn and lesser prairie chicken. Cover may be somewhat deficient for deer, but other sites in close proximity of this site may provide ample cover of woody vegetation. The quality of habitat is generally better for most species if the site is maintained as a tall and midgrass community. An exception to this might be quail, which prefer a lower ecological condition with more annual forbs as long as other habitat components exist on adjacent sites. Domestic livestock performance is much better if the tall and midgrass community is maintained. Ecological processes such as the nutrient cycle and the hydrological cycle are enhanced by the maintenance of a diverse, higher producing plant community.

PLANT COMMUNITIES AND TRANSITIONAL PATHWAYS DIAGRAM:

The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that this would happen the same way in every instance. Local professional guidance should always be sought before pursuing a treatment scenario.



Legend of Symbols:

NF -- no natural or prescribed fire

OG -- overgrazing

PG -- prescribed grazing

BM -- brush management

Threshold



PB -- prescribed burn

GSR -- growing season rest

PM -- pest management (control of annual competition)

RP -- range planting

*Reseeding may be feasible in some cases, but can be difficult due to competing vegetation. Methods will vary depending on circumstances.

As a site changes in the structure and makeup of its plant community, the changes may be due to management, natural occurrences, or both. At some point in time, thresholds are crossed. Once changes have progressed to a certain point, the balance of the community has been altered to the extent that a return to the former state is not possible unless some form of energy is applied to make it happen, and even then some may never return. These changes take place on all the ecological sites, but some sites support communities that are more resistant to change than other sites. Also, some sites are more resilient. They tend to be able to heal or restore themselves more easily. Changes in management practices alone, such as grazing techniques, will not usually be sufficient to restore former plant communities once a threshold has been crossed. An example of energy input might be the implementation of chemical brush management to decrease the amount of woody shrubs and increase the amount of grasses and forbs. This shift in the community balance could not be brought about with grazing alone. The amount of energy required to bring about a change in plant community balance may vary a great deal depending upon the present state and upon the desired result.

The shift in plant community on the Mixedland Slopes site, with improper grazing is fairly predictable. The diagram shows the general pathway that can be expected. When the taller grasses decrease significantly and shrubs increase to greater than 10% canopy, a definite threshold has been crossed. Another threshold is crossed going to a short grass–shrub community. The diagram does not show what will probably happen if the site is not grazed for long periods (many years) and no natural or prescribed fire takes place. With no fire and no grazing, the plant community will become somewhat stagnant, with excessive accumulation of dead plant material evident. The age spread of the different species will be out of balance with nearly all the plants being mature. Few seedlings or juvenile plants will be present. Generally, some encroachment of shrubs will begin with yucca leading the way. In time, the health of the community declines although the composition appears to be changed little. This type of situation can be improved with some prescribed grazing and perhaps with the use of prescribed fire. All of the rangeland sites in this region developed under grazing and fire ecology, and these tools can be used to restore them.

Plant Community Name: Assumed Historic Plant Community

Plant Community Sequence Number: 1

Plant Community Narrative: Tall grass dominant with a variety of perennial forbs and few woody shrubs.



Tall grasses dominate the site with a lesser component of mid grasses present. Perennial forbs are common with a wide variety of species. The major shrubs are yucca, sand sagebrush, and skunkbush sumac with small amounts of sand plum. This photo shows a site that has had no grazing by domestic livestock for 5 years. Some buildup of old plant material is becoming evident, and some grazing would be beneficial, as would the use of prescribed fire.

Annual Production: (Pounds Per Acre)

Plant Type	Low	RV	High
Grass and grasslike	1280	1920	2400
Forbs	180	285	360
Shrubs	80	145	190
Trees	20	20	20
Microbiotic crust	20	30	30
Totals	1600	2400	3000

Structure and Cover

Soil Surface Cover

Basal Cover				Non-Vascular Plants	Biological Crust	Litter	Surface Fragments >1/4 & <= 3"	Surface Fragments > 3"	Bedrock	Water	Bare Ground
Grass/Grasslike	Forb	Shrub/Vine	Tree								

Ground Cover

Vegetative Cover						Non-Vegetative Cover					
Grass/Grasslike	Forb	Shrub/Vine	Tree	Non-Vascular Plants	Biological Crust	Litter	Surface Fragments >1/4 & <= 3"	Surface Fragments > 3"	Bedrock	Water	Bare Ground

Structure of Canopy Cover

	Grass/Grasslike	Forb	Shrub/Vine	Tree
<= 0.5 feet				
>0.5 - <=1 feet				
>1 - <=2 feet				
>2 - <=4.5 feet				
>4.5 - <=13 feet				
>13 - <= 40 feet				
>40 - <=80 feet				
>80 - <= 120 feet				
>120 feet				

Grasses and grass - like (2400 lbs. per acre)

Group	Scientific Name	Common Name	Species production	Group production
1	Bouteloua curtipendula	sideoats grama		300
2	Andropogon hallii	sand bluestem		1200
2	Schizachyrium scoparium	little bluestem	900	
3	Sorghastrum nutans	Indiangrass		300
3	Panicum virgatum	switchgrass		
4	Elymus canadensis	Canada wildrye		200
4	Hesperostipa comata	needle & thread		
4	Pascopyrum smithii	western wheatgrass		
5	Bouteloua gracilis	blue grama		400
5	Sporobolus cryptandrus	sand dropseed		
5	Bothriochloa laguroides	silver bluestem		
5	Bouteloua hirsuta	hairy grama		
5	Digitaria cognata	fall witchgrass		
5	Buchloe dactyloides	buffalograss		
5	Eragrostis trichodes	sand lovegrass		
5	Chloris cucullata	hooded windmillgrass		
5	ARIST	perennial threeawn		
5	Sporobolus asper	meadow dropseed		
5	Dicanthelium oligosanthos	Scribner's panicum		
5	Panicum hallii	Hall's panicum		

Forbs (360 lbs. per acre)

Group	Scientific Name	Common Name	Species Production	Group Production
6	Ambrosia psilostachya	western ragweed		285
6	Desmanthus illinoensis	Illinois Bundleflower		
6	Dalea lasiathera	prairie clover		
6	Liatris punctata	dotted gayfeather		
6	Mimosa microphylla	catclaw sensitivebriar		
6	Dalea aurea	golden prairie clover		
6	Engelmannia peristenia	Engelmann's daisy		
6	Guara coccinea	scarlet gaura		
6	Mentzelia strictissima	sand lily		
6	Penstemon fendleri	Fendler's penstemon		
6	Krameria lanceolata	trailing ratany		
6	Oenothera albicaulis	halfshrub sundrop		
6	Melampodium leucanthum	plains blackfoot		
6	Melampodium cinereum	hoary blackfoot		
6	Berlandiera lyrata	chocolate daisy		
6	Baptisia australis	blue wild indigo		
6	Hedyotis nigricans	prairie bluet		
6	Gilia rigidula	longflower gilia		
6	Polygala alba	white milkwort		
6	Paronychia jamseii	James' nailwort		
6	Eriogonum annuum	annual buckwheat		
6	Eriogonum elatum	tall buckwheat		
6	Helianthus maximiliani	Maximilian sunflower		
6	Salvia azurea	pitcher sage		
6	Evolvulus nuttallianus	wooly evolvulus		
6	Monarda pectinata	plains beebalm		
6	Hoffmannseggia glauca	James rushpea		
6	Heterotheca stenophylla	narrowleaf goldaster		
6	Thelesperma filifolium	plains greenthread		
6	Oligoneuron album	prairie goldenrod		
6	Psoraleidum tenuiflorum	slimflower scurfpea		
6	Scutellaria drummondii	Drummonds skullcap		
6	Chaetopappa ericoides	babywhite aster		
6	Ipomeoea leptophylla	bush morninglory		
6	Chamaecrista nictitans	partridge pea		
6	Stillingia sylvatica	queens delight		
6	Tradescantia occidentalis	prairie spiderwort		
6	Commelina erecta	erect dayflower		
6	Tephrosia virginiana	pastel tephrosia		
6	Senecio riddellii	Riddell's groundsel		

Shrubs (145 lbs. per acre)

Group	Scientific Name	Common Name	Species Production	Group Production
7	Artemisia filifolia	sand sagebrush		145
7	Rhus trilobata	skunkbush sumac		
7	Prunus angustifolia	sand plum		
7	Yucca glauca	yucca		
7	Amorpha canescens	leadplant		
7	Ceanothus americana	inland ceanothus		
7	Gutierrezia sarothrae	broom snakeweed		

Trees (20 lbs. per acre)

Group	Scientific Name	Common Name	Species Production	Group Production
8	Sapindus saponaria	western soapberry		20
8	Celtis occidentalis	hackberry		
8	Populus deltoides	eastern cottonwood		

Plant Growth Number: OK0001

Growth Curve Name: Mixedland Slopes #1

Growth Curve Description: Historic plant community, warm season natives.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
0	2	4	7	20	24	18	9	12	5	2	1

Plant Community Name: Midgrass - Shrub Community

Plant Community Sequence Number: 2

Plant Community Narrative: This plant community is dominated by mid-grasses with 10 - 15% sand sagebrush. Some tallgrass species remain.



This plant community is a midgrass - shrub community with a 10 - 15% canopy of sand sagebrush and increasing. Western ragweed has increased. This vegetative state can be changed with brush management and growing season rest followed by prescribed grazing. A tall and midgrass community can probably be restored within 4 to 5 years. After restoration, prescribed fire and prescribed grazing are practices needed to sustain the tallgrass dominance.

Ground Cover and Structure

Annual Production: (Pounds. Per Acre)

Plant Type	Low	RV	High
Grass and grasslike	900	1400	1700
Forbs	150	220	250
Shrubs	150	250	350
Trees	20	20	20
Microbiotic Crusts	5	5	10
Total	1225	1895	2330

Plant Growth Number: Not assigned

Growth Curve Name: Mixedland Slopes #2

Growth Curve Description: Mixed grass - shrub

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
0	2	6	10	20	18	16	10	10	6	2	0

Plant Community Name: Sagebrush - shortgrass

Plant Community Sequence Number: 3

Plant Community Narrative:

This community is dominated by short grasses and sand sagebrush. The productive capacity is greatly reduced from that of the historic plant community. Infiltration is much less, runoff greatly accelerated, and the ecological processes are not operating efficiently. The community is lacking in diversity and the quality of wildlife habitat and the grazing resource is much less than the original tall and midgrass community.



Short grasses dominate this site, mainly blue grama with some buffalograss and perennial threeawn. Sand sagebrush is a thin canopy at this exact location, but is denser in other areas on the site. This plant community suggests many years of continuous heavy grazing by cattle. It is questionable whether or not it can be restored to the tall - midgrass community because of the lack of a seed source of tall grasses and the dominance of a sod forming, grazing tolerant species such as blue grama. Brush management by herbicide application and light stocking in winter plus 2 years of complete rest in the growing season will improve the ecological condition to the point that mid grasses such as sideoats grama, and possibly some tall grasses, are more abundant and production is greater. This management scenario will shift the plant community closer to plant community #2.

Ground Cover and Structure:

Annual Production: (Pounds Per Acre)

Plant Type	Low	RV	High
Grass & grasslike	600	1000	1100
Forbs	50	100	200
Shrubs	200	250	300
Trees	20	20	20
Total	870	1420	1620

Plant Growth Number: Not assigned.

Growth Curve Name: Mixedland Slopes #3

Growth Curve Description: Short grass - shrub

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
0	2	6	11	22	20	10	8	10	6	4	1

Ecological Site Interpretations:

Animal Community: The animals that use the site as habitat are mainly small mammals, songbirds, with species such as white-tailed deer, mule deer, pronghorn, bobwhite quail and lesser prairie chicken. Predators such as coyote and bobcat hunt prey on this site and will bed down during the day. If the tall and midgrass and forb community exists, this diversity makes the site suitable habitat for all species with the possible exception of quail, which prefer a lower ecological condition with more annual forb species. If the site is abused and becomes short grass dominated, then wildlife numbers will be considerably less.

Plant preferences by animal kind: This rating system provides general guidance as animal preferences for plant species. It also indicates competition between kinds of herbivores for various plants. Grazing preference changes from time to time, especially between seasons, and between animal kinds and classes. Grazing preference does not reflect the ecological status of the plant within the plant community. (P = preferred forage; D = desirable forage; U = undesirable forage; C = plants that are used for cover. For specific guidance on wildlife, Wildlife Habitat Appraisal Guides are available through NRCS for several species.

Animal kind: cattle

Common Name	Scientific Name	Plant Part	Winter	Spring	Summer	Fall
sand bluestem	<i>Andropogon hallii</i>	leaves	D	P	P	D
little bluestem	<i>Schizachyrium scoparium</i>	leaves	D	P	P	D
Indiangrass	<i>Sorghastrum nutans</i>	leaves	D	P	P	P
switchgrass	<i>Panicum virgatum</i>	leaves	D	P	P	D
sideoats grama	<i>Bouteloua curtipendula</i>	leaves	P	P	P	P
Canada wildrye	<i>Elymus canadensis</i>	leaves	P	P	U	D
needle & thread	<i>Hesperostipa comata</i>	leaves	D	D	U	D
western wheatgrass	<i>Pascopyrum smithii</i>	leaves	D	D	U	D
blue grama	<i>Bouteloua gracilis</i>	leaves	P	P	P	P
sand dropseed	<i>Sporobolus cryptandrus</i>	leaves	D	D	D	D
silver bluestem	<i>Bothriochloa saccharoides</i>	leaves	D	D	D	D
hairy grama	<i>Bouteloua hirsute</i>	leaves	D	D	D	D
fall witchgrass	<i>Digitaria cognata</i>	leaves	D	D	D	D
buffalograss	<i>Buchloe dactyloides</i>	leaves	P	P	P	P
sand lovegrass	<i>Eragrostis trichodes</i>	leaves	D	P	P	P
hooded windmill	<i>Chloris cucullata</i>	leaves	U	D	D	D
tumble windmill	<i>Chloris verticillata</i>	leaves	U	D	D	D
Wright threeawn	<i>Aristida wrightii</i>	leaves	U	U	U	U
meadow dropseed	<i>Sporobolus asper (h)</i>	leaves	D	D	D	D
Scribner's panicum	<i>Dicanthelium scriberianum</i>	leaves	D	D	D	D
Hall's panicum	<i>Panicum hallii</i>	leaves	U	D	D	U
western ragweed	<i>Ambrosia psilostachya</i>	stem/leaf	U	U	U	U
Ill. Bundleflower	<i>Desmanthus illinoensis</i>	stem/leaf	U	D	D	U
purple prairie clover	<i>Dalea lasiathera</i>	stem/leaf	U	D	D	U
dotted gayfeather	<i>Liatris punctata</i>	stem/leaf	U	U	U	U
c. sensitivebriar	<i>Mimosa microphylla</i>	stem/leaf	U	D	D	U
golden prairie clover	<i>Dalea lasiathera</i>	stem/leaf	U	U	U	U
Engelmann's daisy	<i>E. pinnatifida</i>	stem/leaf	D	D	D	D
scarlet gaura	<i>Gaura coccinea</i>	stem/leaf	U	D	D	U
sand lily	<i>Mentzelia stricta</i>	stem/leaf	U	U	U	U
Fendler's penstemon	<i>Penstemon fendleri</i>	stem/leaf	U	U	U	U
trailing ratany	<i>Krameria lanceolata</i>	stem/leaf	U	D	D	U
halfshrub sundrop	<i>Calylophus serulatus</i>	stem/leaf	U	D	D	D
blackfoot daisy	<i>Melampodium leucanthum</i>	stem/leaf	U	U	U	U
chocolate daisy	<i>Berlandiera lyrata</i>	stem/leaf	U	D	U	U
wild indigo	<i>Baptisia australis</i>	stem/leaf	U	U	U	U
Maximilian sunflower	<i>Helianthus maximilianus</i>	stem/leaf	U	D	D	U

Common Name	Scientific Name	Plant Part	Winter	Spring	Summer	Fall
Pitcher sage	<i>Salvia azurea</i>	stem/leaf	U	U	U	U
plains beebalm	<i>Monarda pectinata</i>	stem/leaf	U	U	U	U
James rushpea	<i>Hoffmannseggia glauca</i>	stem/leaf	U	U	U	U
goldaster	<i>Heterotheca strictissima</i>	stem/leaf	U	U	U	U
plains greenthread	<i>Thelosperma filifolium</i>	stem/leaf	U	D	D	U
slimflower scurfpea	<i>Psoralea tenuiflora</i>	stem/leaf	U	D	D	U
baby white aster	<i>Chaetopappa ericoides</i>	stem/leaf	U	U	U	U
bush morninglory	<i>Ipomea lyptophylla</i>	stem/leaf	U	D	D	U
queen's delight	<i>Stillingia sylvatica</i>	stem/leaf	U	U	U	U
prairie spiderwort	<i>Tradescantia occidentalis</i>	stem/leaf	U	D	D	U
erect dayflower	<i>Commelina erecta</i>	stem/leaf	U	D	D	U
pastel tephrosia	<i>Tephrosia virginiana</i>	stem/leaf	U	D	U	U
partridge pea	<i>Chamaecrista nictitans a</i>	stem/leaf	U	U	U	U
Riddell's groundsel	<i>Senecio riddellii</i>	stem/leaf	U	U	U	U
sand sagebrush	<i>Artemisia filifolia</i>	stem/leaf	U	U	U	U
skunkbush	<i>Rhus aromatica</i>	stem/leaf	U	U	U	U
sand plum	<i>Prunus gracilis</i>	stem/leaf	U	U	U	U
yucca	<i>Yucca glauca</i>	stem/leaf	U	P	U	U
leadplant	<i>Amorpha canescens</i>	stem/leaf	U	D	D	U
inland ceanothus	<i>Ceanothus americana</i>	stem/leaf	U	D	D	U
broom snakeweed	<i>Gutierrezia sarothrae</i>	stem/leaf	U	U	U	U
western soapberry	<i>Sapindus saponaria</i>	stem/leaf	U	U	U	U
hackberry	<i>Celtis reticulata</i>	stem/leaf	U	D	D	U
cottonwood	<i>Populus deltoides</i>	stem/leaf	U	D	U	U

Animal kind: Deer

Common Name	Scientific Name	Plant Parts	Winter	Spring	Summer	Fall
tall grasses		all	U	C	C	U
mid & short grass		all	U	U	U	U
Illinois bundleflower	<i>Desmanthus illinoensis</i>	leaves/stems	P	P	U	
catclaw sensitivebriar	<i>Mimosa microphylla</i>	leaves/stems	P	P	U	
Engelmann's daisy	<i>Engelmannia peristenia</i>	leaves	P	P	P	
halfshrub sundrop	<i>Oenothera albicaulis</i>	leaves/stems	P	P	D	
Maximilian sunflower	<i>Helianthus maximiliani</i>	leaves	P	D	D	
prairie spiderwort	<i>Tradescantia occidentalis</i>	leaves/stems		P	P	D
annual forbs		leaves/stems	D	P	D	D
sand sagebrush	<i>Artemisia filifolia</i>	leaves/stems	DC	DC	C	C
skunkbush	<i>Rhus trilobata</i>	leaves	DC	DC		
inland ceanothus	<i>Ceanothus americana</i>	leaves/stems	P	P	D	
hackberry	<i>Celtis occidentalis</i>	leaves	P	P	D	

Animal kind: Quail

C = cover NC = nesting cover F = food

Common Name	Symbol	Plant Part	Winter	Spring	Summer	Fall
Bunchgrasses		all	C	NC	NC	C
Annual forbs		seeds		F	F	F
Short and mid grasses						
Shrubs		all	C	C	C	C
C. sensitivebriar	<i>Mimosa microphylla</i>	leaves/stem	F		F	F
James rushpea	<i>Hoffmannseggia glauca</i>	leaves/stem	F	F	F	
Western ragweed	<i>Ambrosia psilostachya</i>	seeds	F			F

Hydrology Functions: If this site is managed at near the presumed historic plant community, runoff is reduced and infiltration is high. If the site is abused and short grasses prevail, then infiltration is low and runoff is increased. It should be noted that if blue grama is growing in a bunchgrass form, then infiltration could slightly increase. The diversity of plants in the historic plant community improves the nutrient cycling process as well as the hydrologic cycle. The site is an upland and has no surface water features itself but due to landscape position, it is important from a watershed standpoint.

Recreational Uses: The site is very attractive to the eye if plant diversity is maintained. The main uses are for hunting, camping, hiking, bird watching, and horseback riding.

Wood Products: N/A

Other products: N/A

SUPPORTING INFORMATION:

Associated Sites: Sites that occur adjacent to or in close proximity to the Mixedland Slopes site: Limy uplands (OK), Deep Sand (OK), Sandy Plains (OK), Breaks (OK), Sandy (TX), Hardland Slopes (TX), Gravelly (TX), and Loamy (TX).

Similar Sites: Mixedland Slopes are most like Sandy Plains or sandy sites in vegetative makeup, but occur in different positions on the landscape. The plant community is more diverse on Mixedland Slopes because, as its name implies, it is a mixed land with sloping topography. There are small inclusions of gravel and tight soil pockets within the site that add to the overall diversity.

Inventory References Data: The vegetative composition is based on long term observations and on several years of range inventory data. Some historical references were also reviewed, along with previous NRCS Range Site Descriptions.

State Correlation: Sites were visited in Roberts County, Texas, Beaver County, Oklahoma, Gray County, Texas, and Lipscomb County, Texas

Other References:

Charles N. Gould, Geology and Water Resources of the Eastern Texas Panhandle, US Geological Survey, US Dept. of Interior, 1907.

Checklist of the Vascular Plants of Texas; Hatch, Stephen L., K. N. Gandhi, and Larry E. Brown, Texas Agricultural Experiment Station, Texas A & M Univ. System, College Station, TX. 1990

Soil Survey Reports Lipscomb Co. Texas, Beaver Co. Okla., Roberts Co. Texas Rathjen, Frederick W., The Texas Panhandle Frontier, Rev. 1998, Univ. of Texas Press

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